

Capital Requirements of New Manufacturing Firms

THE RAPID growth in the business population through mid-1948 and its relative stability thereafter was a significant factor in the postwar trend in investment. The purpose of this article is to provide a quantitative measure of the contribution to over-all investment by new manufacturers in the 1946-48 period and the manner in which such investment was financed. In addition, data are presented on the industrial differences in average and aggregate capital requirements of new manufacturing firms. As discussed at length in the technical notes, the results are based upon the reports of about 1,100 new manufacturing firms which furnished information for the years 1946 through 1948. This article supplements a similar analysis for new trade firms in the December 1948 SURVEY.

These two studies go a long way toward providing an appraisal of the effects of changes in the postwar business population upon the total volume of investment in fixed assets and inventories. While other industries remain uncovered—notably services and construction—new manufacturing and trade firms combined probably account for more than 90 percent of the inventories and 60 percent of the plant and equipment investment of all new nonagricultural firms.

Summary

Of the estimated \$2 billion total of initial capital requirements by new manufacturers during the 1946-48 period, \$800 million was expended on new plant and equipment, \$300 million on inventories, \$500 million in additional working capital, and \$400 million on used plant and equipment. The expenditures for new plant and equipment and for inventories were each about 4 percent of the similar investment by all manufacturing firms. For all nonagricultural business combined, it is further estimated that the direct initial contribution to aggregate investment by new firms in this period amounted to about 10 percent in new plant and equipment and 15 percent in inventories.

About \$1.2 billion of the capital requirements of new manufacturers was financed out of the entrepreneurs' accumulated personal savings. An additional \$300 million was supplied by parent companies' loans and equity investment, and loans by relatives, partners, officers, and directors. Advances by banks, merchandise and equipment suppliers, and government agencies accounted for over \$450 million of the initial funds—banks alone accounted for over \$250 million, merchandise suppliers for \$50 million, and equipment suppliers for \$150 million. The remaining investment funds came from the sales of more than \$50 million of new stock and \$10 million of bond issues.

This distribution of the major sources of funds was quite similar to that found among new trade firms. For both industry groups, equity financing, including the personal saving of entrepreneurs, constituted about two-thirds of the total sources of funds for new firms.

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The capital markets were of little importance as a source of funds for new firms. Combining new manufacturing and trade concerns, about \$100 million was raised from public issues during this 3-year period. Bank loans—constituting over 13 percent of the total sources of funds for new manufacturing and trade firms—were more important, amounting to more than \$1.0 billion for the two groups combined. While new trade and manufacturing firms accounted for over 10 percent of the total change in outstanding bank loans during this period, public issues for these new firms represented less than 1 percent of total net new issues.

Aggregate and Average Investment

The establishment of 166,000 manufacturing firms in the 3 years 1946 through 1948 resulted in an estimated initial capital investment of approximately \$2 billion.¹ The lumber and timber basic products industry accounted for almost 25 percent of this investment and nearly 45 percent of the total number of new manufacturing concerns. This group included over three-fifths of all firms without any employees—and, as a result, had the lowest average investment of any major industry.

The textiles industry with less than 2 percent of the total new entrants accounted for 6 percent of the aggregate investment as a result of its high average requirements. New manufacturers in the food, apparel, metals, machinery and stone, clay and glass industries accounted for from 5 to 9 percent each of the over-all investment. The lowest aggregate investment—and the lowest number of new firms—were in the rubber and petroleum products industries.

As compared with manufacturing, the initial capital requirements of new wholesale and retail trade firms in the 3 years 1945-47, as indicated in the previous survey, amounted to \$1.5 billion and \$5 billion, respectively. (See chart 1.)² The average initial investment of manufacturing firms, inclusive of no-employee firms, is estimated at \$12,000 as compared to \$22,000 and \$9,500, respectively, in wholesale and retail trade.

The average initial investment of new lumber firms was only slightly over \$6,000, compared to an average investment by new non-lumber manufacturers of \$16,500. Lumber and apparel were the only industries with investment below the average for all manufacturing. The largest average investment, \$43,000 and \$22,000, respectively, was found in the textiles and food processing industries.³

¹ This figure is based on appropriately weighted sample data plus a rough estimate of the investment of new manufacturers without any employees. This estimate is more fully discussed in the technical notes.

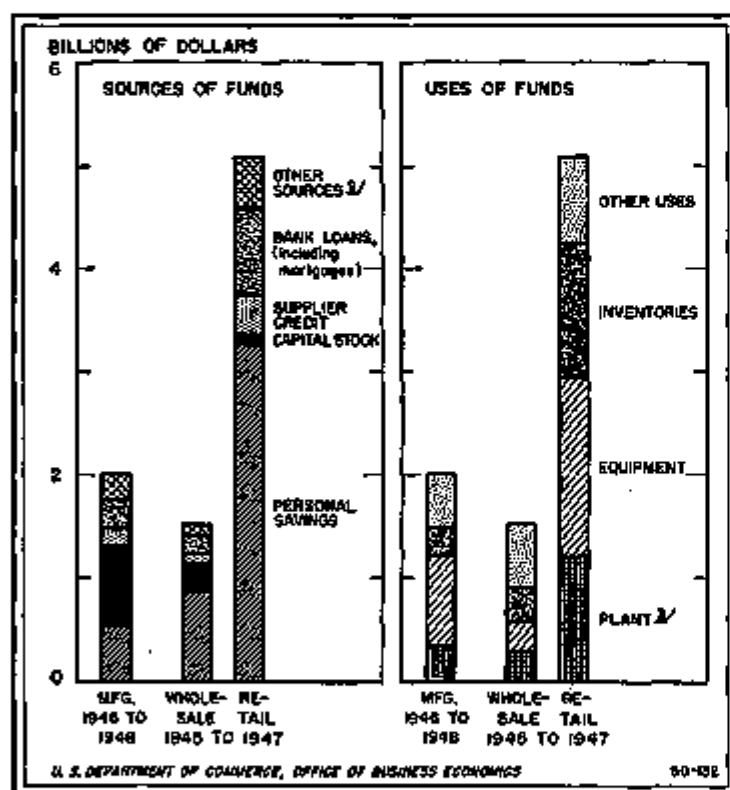
² These estimates have been slightly revised since publication in the December 1948 SURVEY OF BUSINESS due to a revision of the population statistics (see "Revised Estimates of the Business Population, 1929-48," SURVEY, June 1949). It will be assumed in this article that no adjustment is necessary for the differences in timing in the two studies. 1946 and 1947—the 2 years common to both surveys—accounted for more than 75 percent in trade, and 75 percent in manufacturing, of all entrants in those fields during the respective survey periods. While fixed assets and other costs were considerably higher in 1948 than in 1946, the number of new manufacturing firms established in 1948 was one-fifth lower than in the earlier year.

³ On a more detailed industry breakdown, some industries—e. g., automobile manufacturing—would show a higher average investment than the groups indicated above.

Charts 2 and 3 show the average investment of new firms for the major manufacturing industries and by sales-size within these industries. In view of the low average investment for the universe of new lumber firms, it is interesting to note that, when firms with no employees are eliminated, the average investment in this field is higher than the average for all manufacturing industries. The average investment in apparel was lower, and in food and textiles higher, than the all-industry average for a given sales-size. The latter results are consistent with the over-all figures inclusive of firms without employees.

As pointed out in the previous article on trade firms, the availability of capital and the price level in the postwar period had a considerable influence on both aggregate investment or scale of operations of these firms and the distribution of that investment among uses as well as sources. It is also quite possible that the average experience differs from the optimum capital requirements of these firms.

Chart 1.—Manufacturing and Trade Firms Starting Operations in the Postwar Period: Sources and Uses of Initial Investment¹



¹ See text footnotes 1 and 2, page 11.

² Includes bonds and a small amount of nonbank mortgage loans.

³ Includes renovation, land, and a small amount of depletable resources.

Source of data: U. S. Department of Commerce, Office of Business Economics.

Limitations of the sample data

Thus far, this article has presented universe estimates based on the sample data. The size of the sample, however, does not permit the derivation of all of the universe estimates necessary for comprehensive examination of the characteristics of new manufacturing firms. In the following detailed analyses of the survey results, the unadjusted sample data will be used whenever there is stratification by size and legal status. This stratification adjusts for the inadequate representation of firms no longer in business, and for other proportions of the sample. Where such stratification is not

shown, the sample data have been weighted by size and legal form of organization.

The shortcomings of the data and some measures of their sampling variability are fully discussed in the technical notes. It may be noted here that the major limitation in the sample arises from the absence of firms with no employees, though an adjustment for this group has been made in arriving at the universe estimates. In general, the errors of estimation associated with the sample data are relatively small. However, in tables 1 and 6 where dollar figures by size and industry are given, the large number of cells results in rather sizable sampling variability in some instances so that the data should be used as orders of magnitude rather than precise measures.

It should be noted that the investment-size classification is based on initial investment without regard to either year of entry or subsequent changes in assets. The sales-size tabulation is based on 1948 sales without any allowance for either the year of entry or the differential growth in sales during the 1946-48 period. The classification of firms operating from 6 to 11 months in 1948 was based on the annual rate of their partial year sales in 1948. Firms operating less than 6 months in 1948 were eliminated from this tabulation.

Another factor meriting mention here relates to the timing of the data submitted by the sample firms. The reporting firms could be divided into three clearly defined groups. The first group, consisting of 92 percent of the sample, reported their investment essentially at the time they started production.

The second group reported their assets and liabilities on the last day of their first calendar or fiscal year in business. These companies (about 3 percent of the sample) reported small amounts of trade receivables and net profits or losses. The initial investment of these firms was adjusted by either reducing (or increasing) their investment by the amount of net profits (or losses) reported.

The last group (about 5 percent) reported their investment some time before their start of production. These companies typically report their entire investment as current assets (other than inventories) and, on the sources side, as equity capital. Since many firms in this group were still exploring credit lines, there was some understatement in the amount of reported investment. The reports of these firms were eliminated from the sample tabulations.

Sources of Capital Supply

About 59 percent of the capital requirements of all new manufacturers was met by the equity capital investment of the entrepreneurs themselves. Another 7 percent was also equity capital coming from parent companies and the capital markets—mainly the former. The remaining 34 percent was debt financing, with the banks supplying 13 percent (mostly mortgage loans), merchandise and equipment supplies 9 percent, and bond sales less than 1 percent. Loans by individuals, parent companies, and governmental agencies accounted for 11 percent.

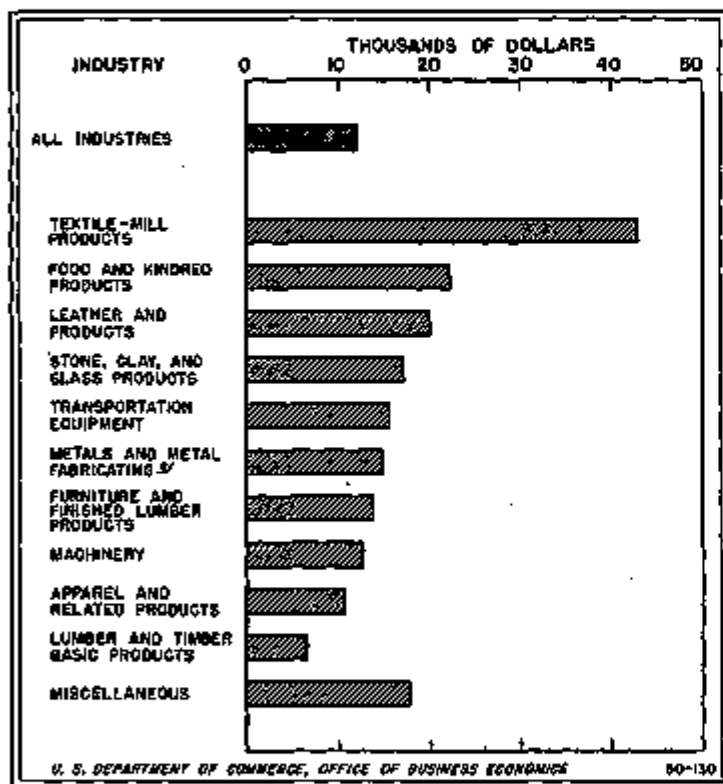
The distribution of the sources of capital supply of new manufacturing establishments differed according to size of firm, legal status, industry and, within firms, by the uses of invested capital. The most significant divergencies are noted when comparison is made in terms of sales-size and investment-size (tables 2 and 3).

As the firm-size increased, the relative investment in total equity capital among both corporate and noncorporate firms declined and total debt financing increased. However, within corporate equity capital, the relative importance of stock subscriptions by parent companies and by the general

public varied directly with size of firm, while those by officers and directors varied inversely.⁴ Similarly, within debt financing, while merchandise credit, industrial bank loans, and mortgages on business properties increased with firm-size, there was a tendency for nonbank, nonsupplier credit to decrease. The latter tendency was due to the influence of loans from friends and relatives—an important source of funds for the smaller concerns.

When the sample data were examined by legal status, it was found that the equity in new corporate firms was somewhat larger than in new unincorporated concerns within comparable size groups due to the greater availability to corporations of parent company and general public equity funds (see chart 4). Within comparable—and especially in the larger—sales-size groups, personal savings of noncorporate entrepreneurs were a higher proportion of initial investment than were stock subscriptions of officers and directors in corporations.

Chart 2.—Manufacturing Firms Starting Operations in the 1946-48 Period: Average Initial Investment, by Industry¹



¹ See text footnote 1, page 11.

² Classification excludes machinery and transportation equipment.

Source of data: U. S. Department of Commerce, Office of Business Economics.

The methods of financing new firms are also associated with, and in some cases dependent upon, the distribution of these funds into the various types of assets. For example, the entrepreneur purchasing a plant has access to either a mortgage loan or an industrial loan, secured by his plant. The volume of credit available from suppliers of merchandise and equipment is, of course, related to the size of inventory and equipment investment. Bank credit is also obtained on equipment and inventories—although these types of collateral are not so important as plant.

⁴ It should be noted that, in this article, stock subscriptions by the general public refer to stock subscribed by other than the officers, directors, and parent or affiliated companies of a new firm—and not necessarily to widely distributed public offerings. There was only one sizable public issue registered with the Securities and Exchange Commission which was in the scope of this survey. This issue by an automobile company accounted for over one-fourth of the estimated stock sales to the general public.

Sources by industries

In general, the industrial differences in the distribution of the sources of investment funds among new manufacturing firms were found to be related to variations in fixed assets and inventory requirements, and, to a lesser extent, to average investment. This can be seen by referring to the data in table 4. For example, apparel manufacturers with relatively low plant and inventory investment received proportionately less industrial and mortgage bank loans and less merchandise supplier credit than did most other industries. They purchased moderately less equipment and received moderately less equipment credit than did the average new manufacturing firm. And, as might be expected on the basis of their low average investment, apparel manufacturers relied relatively more heavily on equity capital (including personal savings) than did most other industries.

Sources of funds of new and established corporations

Although balance sheet data are not available for all noncorporate manufacturers, comparison can be made between the liabilities of new manufacturing corporations and those of existing corporations. The relative initial equity among new firms was found to be considerably greater than among small concerns which have been operating for a period of years and which are most directly comparable in size to new firms.

The initial short-term liabilities of new manufacturing corporations were much lower, and long-term liabilities were about the same, as were the corresponding proportions among small existing concerns. In long-term liabilities, the considerably smaller proportion of bonded debt of new firms was offset by the relatively larger mortgage debt.

Flow of saving into investment

It is estimated that all manufacturers starting operations in the 3 years 1946 through 1948 transferred more than \$1.2 billion of their accumulated personal savings into assets of their businesses. Approximately \$550 million of this investment was channeled into new corporations in the form of stock subscriptions by officers and directors. The remainder represented the personal savings of noncorporate entrepreneurs.

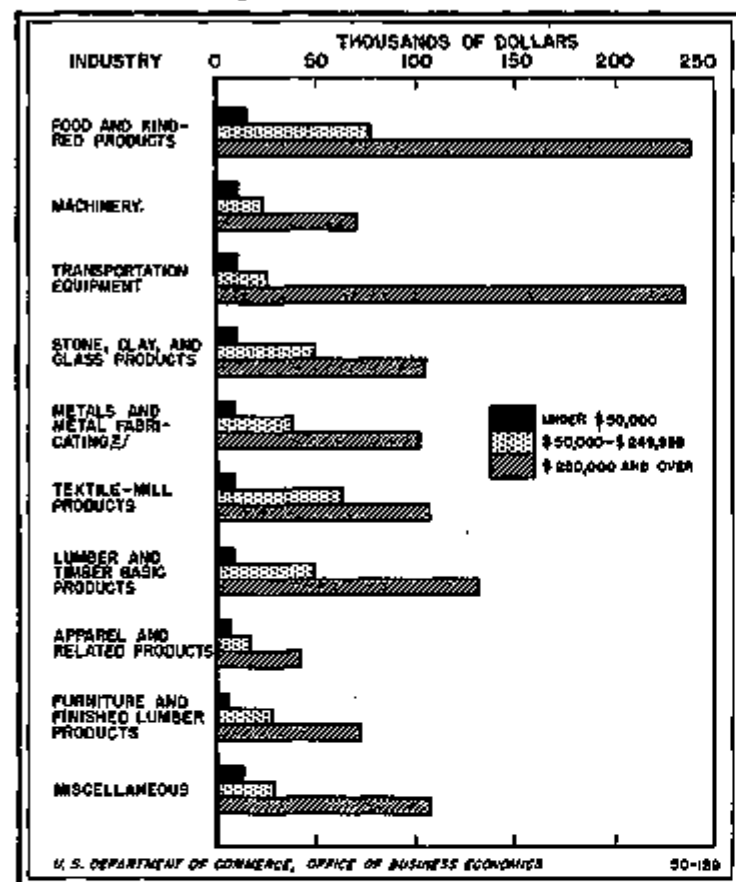
Thus, with the over \$4.4 billion of personal savings invested in new trade firms, about \$5.6 billion of the \$8.6 billion total capital requirements of new manufacturing and trade firms in the 3 postwar years was met by the past savings of the entrepreneurs themselves. Additional stock subscriptions by parent or affiliated companies and the general public brought the total equity capital initially invested to about \$5.8 billion. Of this amount, \$4.8 billion went into noncorporate enterprises and \$1.0 billion into corporate concerns. In addition, these new firms provided direct investment outlets for other individuals' savings—mostly in the form of personal loans and, to a much lesser extent, in new issues of bonds.

Based on the sample, 47 percent of both corporate and noncorporate new manufacturing firms was financed entirely through personal savings or through capital stock subscriptions of officers and directors.⁵ An additional 48 percent supplemented personal savings with debt financing. Of the remaining 5 percent, 2 percent (almost 4 percent of the corporate sample) financed entirely through parent company stock investment, almost 3 percent (6 percent of the non-

⁵ Since the use of personal savings has been found to vary inversely with size of firm, the exclusion of firms with no employees from the sample results in an understatement of the proportion of firms financing entirely through personal savings.

corporate sample) entirely through debt financing and less than one-half of one percent entirely through stock sales to the general public.

Chart 3.—Manufacturing Firms Starting Operations in the 1946-48 Period: Average Initial Investment, by Industry, Grouped According to Sales in 1948¹



¹ The data represented by this chart should be used to indicate orders of magnitude rather than precise measures of average investment. See also footnote 1, table 1, and "Technical Notes" section in the text.

² Classification excludes machinery and transportation equipment.

Source of data: U. S. Department of Commerce, Office of Business Economics.

Bank credit as source of funds

Bank credit was the most important form of debt financing utilized by new manufacturers in the 1946-48 period. This result is similar to that found in the survey of new trade firms. Of the more than \$250 million of bank credit to new manufacturers, 37 percent was mortgage loans on business properties, 20 percent was mortgage loans on other properties and the remaining 43 percent was in the form of nonmortgage industrial loans.

For sample firms only, about one out of every five reported receiving bank credit totaling 35 percent of their combined initial capital requirements and 15 percent of the requirements of all sample firms. In general, bank credit was utilized to a greater extent proportionately by firms with a larger investment in fixed assets, by the larger concerns and, for a given size of company, by noncorporate firms for which such credit was more readily available as a result of their unlimited liability. New firms owning their plants, accounting for 21 percent of the concerns in the sample, received 75 percent of all bank credit.

When examined by type of bank loan, it is found that non-mortgage loans and mortgage loans on business properties tended to assume greater relative importance as firm size increased, while the relative importance of mortgage loans

on nonbusiness properties varied inversely with size. The latter result was probably due to the greater use of mortgage loans on residences by the smaller entrepreneurs.

Supplier credit and capital requirements

Suppliers of merchandise and equipment to new manufacturing firms advanced almost \$200 million of the latter's initial capital requirements. Almost three-fourths of this credit was on the purchase of equipment. While this was partly a reflection of the greater investment by new firms in equipment than in inventories, it may also be evidence that supplier credit was relatively easier on equipment purchases than on merchandise purchases. For all new firms, merchandise credit was 18 percent of inventory investment while equipment credit was 24 percent of new equipment outlays. It should be noted that small existing firms also utilize equipment to a greater extent than inventories as collateral on bank loans.⁴

The sample returns pointed to clear relationships between merchandise credit and inventory investment and between equipment credit and equipment purchases. In general, the data indicated that the relative proportions of both equipment and equipment credit to total investment varied inversely with size, while the proportions of both inventories and merchandise credit varied directly with size. However, there was a tendency for the ratios of credit to purchases of both equipment and merchandise to increase with firm-size—probably reflecting the better credit standing of the larger firms.

Other sources of funds

Almost \$250 million of the initial credit needs of new manufacturers was supplied by nonbank and nonsupplier sources. Among the sample's corporate firms about 25 percent was supplied by officers and directors, 18 percent by parent companies, 18 percent by stockholders of undesignated type, 5 percent by government agencies (mainly Reconstruction Finance Corporation and the War Assets Administration), 5 percent by nonbank mortgages, 6 percent by personal loans (other than those stipulated above), and 25 percent by unspecified lenders.

Among the sample's noncorporate firms, personal loans accounted for 49 percent of "other" sources, Government loans for 21 percent, nonbank mortgage loans 3 percent, partners' loans 3 percent, and unspecified lenders 24 percent.

In general, these sources of funds, as a whole, are found to account for a decreasing proportion of total requirements as sales-size increases. They also were relatively larger among corporate firms than among noncorporate concerns due to the large volume of parent-company advances. Among the smallest sales-size group, however, these sources of funds are proportionately larger among noncorporate firms due to a high concentration of personal loans from friends and relatives.

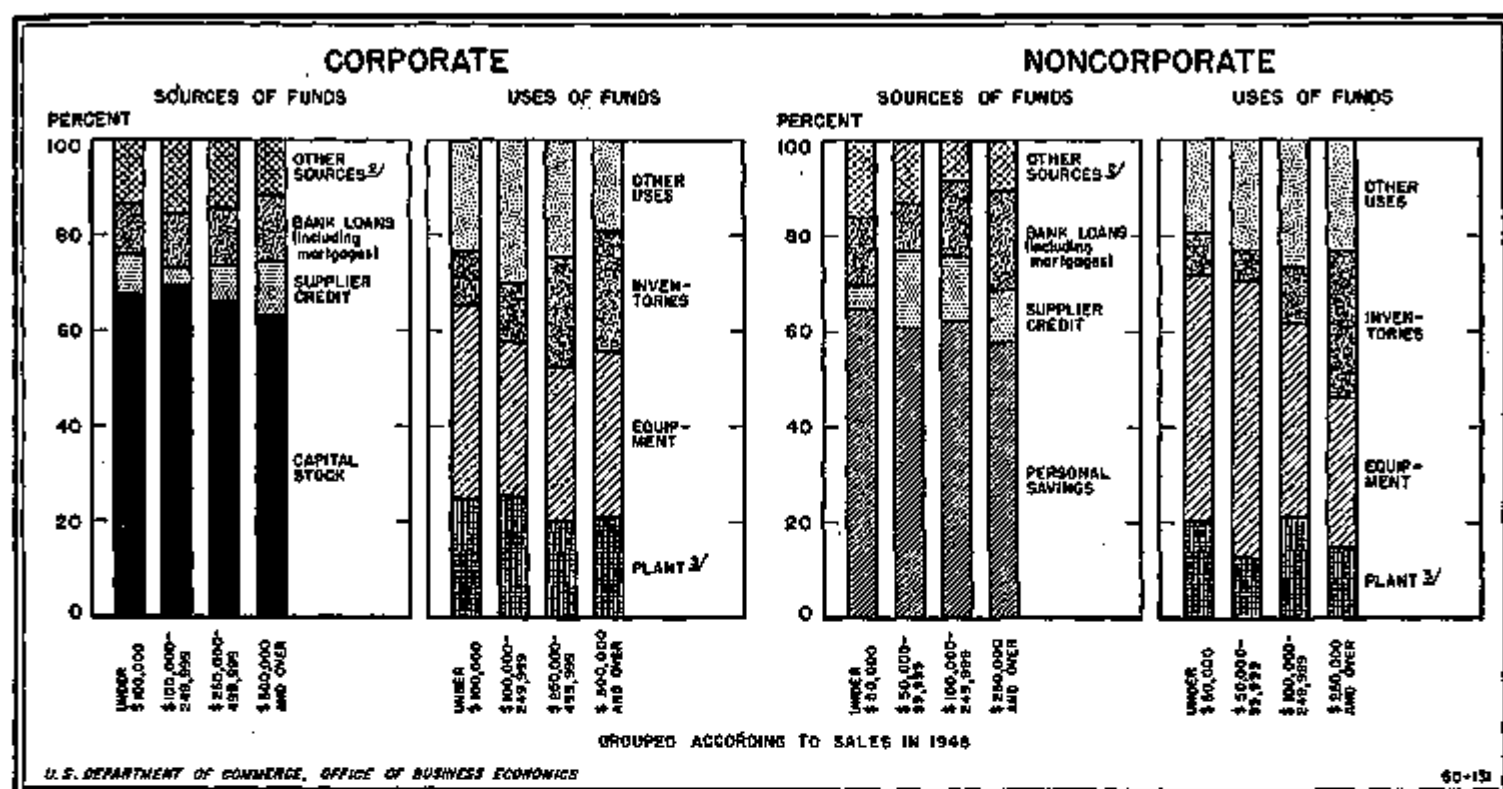
The Disposition of Investment Funds

Manufacturing firms entering the business population in the 1946-48 period invested somewhat over 60 percent of their total capital in fixed assets, almost 15 percent in inventories, while the remaining one-fourth was kept for other working capital needs.

The relative proportion invested in fixed assets is somewhat larger, and in inventories somewhat lower, than the

⁴ For firms with assets under \$50,000, according to a Federal Reserve Bank loan survey, the value of outstanding loans on November 30, 1946, secured by equipment were about three times those secured by inventories. For all firms, however, the latter type of loan is more important than the former type.

Chart 4.—Corporate and Noncorporate Manufacturing Firms Starting Operations in the 1946-48 Period: Percentage Distribution of Sources and Uses of Initial Investment, by Legal Status, Grouped According to Sales in 1948¹



¹ See footnote 1, table 2.

² Includes bonds and a small amount of nonbank mortgage loans.

³ Includes renovation, land, and a small amount of depletable resources.

Source of data: U. S. Department of Commerce, Office of Business Economics.

corresponding investments of either new trade firms or large and small established manufacturing firms. This is due in part to the fact that while a new manufacturer initially obtains the necessary plant and equipment consistent with the expected volume of operations in his early stage of development, his purchase of inventories can frequently be delayed until he receives his orders.

When examined in terms of size of firm, the sample indicated that the larger new manufacturing firms tended to invest relatively more heavily in current assets than did the smaller firms.

Plant and equipment outlays

It is estimated that \$1.2 billion was expended for fixed assets by new manufacturers in the 1946-48 period. Almost \$600 million was for new equipment, about \$200 million for the new plant and over \$25 million for renovation of rented plant. Used equipment and used plant outlays were somewhat less than \$300 million and \$100 million, respectively, while land purchases amounted to almost \$50 million.

The expenditures for new plant and equipment by new manufacturers were about 4 percent of the total expenditures of all manufacturers in this period. In trade—a field where there is considerably less concentration of large firms—new firms made about one-third of the fixed asset investment of all trade firms.

Utilizing the findings in the new trade firm survey, and making rough allowance for uncovered industries, it is estimated that all new firms in the postwar period through 1948 accounted for about 10 percent of the new plant and equipment expenditures by all nonfarm business—both old and new. It should be borne in mind that few new firms enter the railroad and public utility fields which in the

1946-48 period accounted for close to 30 percent of the nonfarm business investment in plant and equipment.

This estimate of the contribution of new firms measures only the immediate and direct investment of these firms. No allowance is made for either capital outlays for plant and equipment by other groups for rental to new firms, or for the replacement of used plant and equipment sold to new firms. In addition, data collected in this survey (which will be presented more fully in a subsequent article on the operating experience of new manufacturers) indicate that the capital goods investment of successful new firms grew quite rapidly in their first 2 years of operation.

It should be borne in mind, however, that the postwar business population experienced its greatest growth in 1946, grew moderately in 1947 and early 1948 and has been relatively stable since mid-1948. Thus the contribution of new firms to business investment has been of dwindling importance since 1946.

An outstanding difference between new trade firms and new manufacturing firms was noted in the size and industry relationships between fixed assets and total investment in the two groups. In the case of trade firms, there was clear evidence that within lines of trade the proportion of plant expenditures to total investment varied directly, while the proportion of equipment investment varied inversely, with firm size. Within manufacturing industries, while such tendencies existed, the relative importance of fixed investment more closely corresponded with type of industry than it did with size. These differences in trade and manufacturing arise mainly from the more homogeneous fixed assets requirements of the various lines of trade as compared to the heterogeneous nature of the different fabricating processes.

In manufacturing industries with high plant expenditures relative to total investment, such as food processing, stone, clay and glass, and transportation equipment, it was found that even the smallest sales-size group had proportionately greater plant investment, than did the largest new firms in industries like apparel, textiles and machinery. Plant investment by apparel manufacturers was relatively negligible even in the largest sales-size group. The relative importance of equipment outlays, similarly, was more closely related to industry than to size.

Working capital requirements

The initial investment in inventories by new manufacturers in 1946, 1947 and 1948 amounted to \$300 million—over 4 percent of the net change in inventories of all manufacturing concerns. The proportion of new inventory investment made by new trade firms was about one-third of that made by all trade firms. Making an arbitrary allowance for the contribution of new firms outside the trade and manufacturing fields, it is estimated that all new nonagricultural firms in the period between 1945 and 1948 made about 15 percent of the total new investment in nonfarm inventories.

Within the manufacturing sample, inventories were found to be larger relative to total investment among the larger firms than among smaller concerns. This was also true among new wholesale and retail trade firms.

Other working capital, as a proportion of total investment, increased with sales-size among the smaller sales-size groups. However, the proportion began to decline with size for the groups with sales of over \$250,000—in large part as a consequence of the rapidly increasing relative importance of inventories.

Plant ownership and rental

Based on the reporting panel (firms with one or more employees), the average capital requirements of new manufacturers occupying their own plant was about three times that of the average new firm renting its plant. The survey results were as follows:

	Renters	Nonrenters
Corporate:		
Average investment.....	\$42,500	\$145,400
Average plant investment.....		48,700
Noncorporate:		
Average investment.....	14,800	38,300
Average plant investment.....		9,000

As a result of the differential in size of average investment and the additional credit facilities arising out of plant ownership, there are marked differences in the relative distribution of the sources and uses of funds between renters and nonrenters. The latter group finance their investment to a considerably greater degree through bank credit, mortgage loans and bonds than do the former group (see table 5).

Since a large proportion of the nonrenters' initial capital goes toward plant purchase, their investment in equipment, inventories and other current assets is lower relative to total investment than the corresponding investment of renting concerns. If plant outlays are removed entirely from the distribution of invested funds, it is found that nonrenters invest proportionately more in equipment and inventories and less in working capital other than inventories. The larger relative investment in inventories and lower investment in other working capital needs are primarily functions of the larger average size of the nonrenting group. The explanation of the larger proportionate investment in equipment, which, as noted previously, generally varies inversely with size of firm, is that a large number of plant renters were able to also rent fixtures and machinery.

Surviving and discontinued firms

The Office of Business Economics is planning a survey of the factors resulting in business failures. While the present survey was not designed to study the distinguishing characteristics between surviving and discontinued firms, the sample returns make possible a few general observations.

The outstanding difference was in the average size of investment. The average investment of the unsuccessful firms in the sample was about 55 percent of that of the sample's surviving firms. Another significant characteristic of discontinued firms was their relatively low initial investment in new plant, even when allowance is made for their smaller average size.

It is still a matter of speculation as to the extent that these firms unsuccessfully sought, or would have been helped by, outside financing. Another question arises as to the part that plant ownership plays in delaying the abandonment of enterprises which are not conspicuously successful.

Investment turn-over

The sales per dollar of investment among new manufacturing concerns, as among new trade firms and established manufacturers, was found to be greater for smaller firms than for larger firms. Comparison by occupancy status and industry (table 6) confirms the finding in the trade study that investment turn-over tends to decrease as plant size increases.

Within manufacturing industries, the largest volume of sales per dollar of investment occurred in industries such as apparel and leather products—industries reporting the lowest relative plant investment. On the other hand, food, construction materials and metals show the smallest investment turn-over and proportionately high plant requirements.

Differences among industries, as might be expected, appear to be closely related to the average ratio of net profits to sales. There tends to be an inverse relationship between profit margins on sales and investment turn-over since, in the industries where margins are high, entrepreneurs are willing to invest more heavily relative to sales. It is obvious, of course, that profit margins are affected by, as well as affect, investment turn-over. It should also be noted that other characteristics of the different industries, including the investment size of the average firm, influence their sales per dollar of investment.

Table 1.—Manufacturers Starting Operations During 1946-48: Average Initial Investment by Industry, Grouped According to Sales in 1948¹

Industry	Sales size ²		
	Under \$50,000	\$50,000-\$249,999	\$250,000 and over
Food and kindred products.....	14,900	77,500	238,400
Textile-mill products.....	4,400	62,100	107,100
Apparel and related products.....	6,500	16,400	42,500
Lumber and timber basic products.....	8,200	49,200	131,000
Furniture and finished lumber products.....	8,200	28,400	72,200
Stone, clay and glass products.....	16,900	48,400	104,200
Metals and metal fabricating.....	9,000	38,600	101,000
Machinery.....	11,500	23,600	70,700
Transportation equipment.....	11,300	28,600	284,600
Miscellaneous.....	12,800	29,300	107,600

¹ The figures in this table should be used to indicate orders of magnitude, and not precise measures of average investment, since some of the cells are based on small samples and firms with no employees are omitted. Data are based on the initial investment and make no allowance for subsequent changes in asset position. The sales size classification of firms operating less than 12 months in 1948 was based on the annual rate of their partial year sales in 1948. Firms operating less than 6 months in 1948 were eliminated.

² Metal fabricating industries exclude machinery and transportation equipment.

Source: U. S. Department of Commerce, Office of Business Economics.

Table 2.—Manufacturing Firms Starting Operations in the 1946-48 Period: Percentage Distribution of Sources and Uses of Initial Investment, by Legal Status and 1948 Sales-Size Group¹

Item	Corporate				Noncorporate			
	Under \$100,000	\$100,000-\$250,000	\$250,000-\$500,000	\$500,000 and over	Under \$100,000	\$100,000-\$250,000	\$250,000-\$500,000	\$500,000 and over
Sources, total.....	100	100	100	100	100	100	100	100
Personal savings.....					65	61	63	58
Capital stock:								
Officers and directors.....	49	57	64	37				
Parent company.....	4	7	11	19				
General public.....	2	5	1	11				
Supplier credit:								
Merchandise.....	3	1	4	5	2	2	3	2
Equipment.....	3	2	4	6	3	14	10	3
Bank loans:								
Nonmortgages.....	3	4	3	4	0	4	0	16
Mortgages:								
On business properties.....	7	6	3	10	0	6	0	2
On other properties.....	1	1	1	(7)	3	(7)	4	1
Other sources ²	13	16	13	12	10	13	9	10
Uses, total:								
Plant ³	25	26	29	21	20	19	22	15
Equipment.....	40	32	32	33	51	58	40	31
Inventories.....	11	12	23	26	9	6	12	31
Other current assets.....	23	30	25	19	19	23	27	23

¹ Data are based on the initial investment and make no allowance for subsequent changes in asset position. ² The sales-size classification of firms operating less than 12 months in 1948 was based on the annual sale of their partial year sales in 1948. ³ The sample excludes firms with no employees. Detail will not necessarily add to totals because of rounding.

⁴ Less than 0.5 percent.

⁵ Includes bonds and a small amount of nonbank mortgage loans.

⁶ Includes renovation, land and a small amount of depletable resources.

Source: U. S. Department of Commerce, Office of Business Economics.

Table 3.—Manufacturing Firms Starting Operations in the 1946-48 Period: Percentage Distribution of Sources and Uses of Initial Investment, by Legal Status and Initial Investment Size¹

Item	Corporate				Noncorporate			
	Under \$20,000	\$20,000-\$50,000	\$50,000-\$100,000	\$100,000 and over	Under \$10,000	\$10,000-\$20,000	\$20,000-\$50,000	\$50,000 and over
Sources, total.....	100	100	100	100	100	100	100	100
Personal savings.....					69	61	63	58
Capital stock:								
Officers and directors.....	74	70	68	34				
Parent company.....	5	8	9	18				
General public.....	2	1	5	8				
Supplier credit:								
Merchandise.....	1	3	4	4	2	7	3	0
Equipment.....	4	4	3	5	7	0	4	0
Bank loans:								
Nonmortgages.....	2	2	4	4	0	4	7	11
Mortgages:								
On business properties.....	1	3	5	11	2	3	10	0
On other properties.....	(4)	(4)	1	1	2	1	8	2
Other ²	12	12	10	15	12	15	10	15
Uses, total.....	100	100	100	100	100	100	100	100
Plant ³	8	10	14	27	11	12	25	10
Equipment.....	48	37	38	32	58	51	43	35
Inventories.....	17	17	20	21	9	13	9	25
Other current assets.....	21	35	28	20	22	24	23	24

¹ Excludes firms with no employees. Detail will not necessarily add to totals because of rounding.

² Includes small amount of bond sales and nonbank mortgages.

³ Includes renovation and land and a small amount of depletable resources.

⁴ Less than 0.5 percent.

Source: U. S. Department of Commerce, Office of Business Economics.

Table 4.—Manufacturing Firms Starting Operations in the 1946-48 Period: Percentage Distribution of Sources and Uses of Initial Investment Funds by Industry¹

Item	All Industries	Food and kindred products	Textile-mill products	Apparel and related products	Lumber and timber base products	Furniture and finished lumber products	Leather and products	Stone, clay and glass products	Metals and metal fabricating ²	Machinery	Transportation equipment	All other
Sources.....	100	100	100	100	100	100	100	100	100	100	100	100
Personal savings.....	24	28	12	20	41	19	21	27	20	14	21	18
Capital stock.....	42	20	60	50	15	61	55	22	27	50	52	44
Bond sales.....	1	1	(7)	3	(7)	1	(7)	4	(7)	(7)	(7)	(7)
Supplier credit:												
Merchandise.....	3	3	2	1	2	3	6	2	4	5	4	2
Equipment.....	7	2	3	0	11	2	3	0	4	2	2	11
Bank loans:												
Nonmortgages.....	6	7	2	2	14	3	4	10	3	1	0	2
Mortgages:												
On business properties.....	5	11	11	1	3	1	2	5	2	10	1	5
On other properties.....	3	3	3	2	4	(7)	1	3	1	1	(7)	2
Other sources.....	11	9	12	10	10	10	10	11	5	10	12	16
Uses.....	100	100	100	100	100	100	100	100	100	100	100	100
Plant:												
New.....	10	10	4	3	11	7	(7)	10	13	2	14	10
Used.....	4	5	4	3	4	7	(7)	3	3	13	3	2
Renovation.....	2	3	3	4	1	4	2	1	3	1	1	3
Equipment:												
New.....	20	20	35	23	33	19	19	23	24	14	10	29
Used.....	13	7	13	17	10	10	0	6	18	14	10	11
Other fixed assets ³	2	2	1	(7)	4	3	(7)	4	2	1	2	1
Inventories.....	15	12	11	11	12	20	20	11	10	17	33	15
Other current assets.....	20	20	23	40	16	25	35	11	25	35	18	20

¹ Excludes firms with no employees. Detail will not necessarily add to totals because of rounding.

² Excludes machinery and transportation equipment.

³ Less than 0.5 percent.

⁴ Includes land and a small amount of depletable resources.

Source: U. S. Department of Commerce, Office of Business Economics.

Table 5.—Manufacturing Firms Starting Operations in the 1946-48 Period: Percentage Distribution of Sources and Uses of Initial Investment Funds by Occupancy and Legal Status¹

Item	Occupancy and legal status			
	Corporate		Noncorporate	
	Renting concerns	Nonrenting concerns	Renting concerns	Nonrenting concerns
Sources, total	100	100	100	100
Personal savings			00	80
Capital stock:				
Officers and directors	53	29		
Parent company	12	3		
General public	7	6		
Supplier credit:				
Merchandise	4	3	5	3
Equipment	6	4	8	5
Bank loans:				
Nonmortgages	3	4	7	9
Mortgages	3	17	5	11
Other sources ²	12	10	15	12
Uses, total	100	100	100	100
Plant	0	32	0	37
Removal	4	3	2	1
Other fixed assets ³	4	1	1	0
Equipment	30	20	47	26
Inventory	25	18	26	9
Other current assets	31	10	21	24

¹ Excludes firms with no employees. Detail will not necessarily add to totals because of rounding.

² Includes small amount of bond sales and nonbank mortgages.

³ Includes land and a small amount of depletable resources.

Source: U. S. Department of Commerce, Office of Business Economics.

TECHNICAL NOTES

The present study on new manufacturing firms, like the previous one covering trade, is based on replies to a questionnaire by a sample of companies drawn from the records of the Bureau of Old Age and Survivors Insurance, Federal Security Agency. The sample was selected from the list of manufacturing companies registered with the BOASI which started a new business during the period 1946-48. It thus excludes manufacturing firms without employees, which generally have no reason to report to BOASI. Estimates for this last group were, however, included in the total investment and financing figures.

Questionnaires were mailed to all manufacturing firms listed as having 29 or more employees, and to a 5 percent sample of those with fewer than 20 employees. Roughly half of the returns in the first mailing were reported out of business, or for other reasons not at the address given. Sample tests against BOASI records have shown that practically all firms not located by the Post Office have ceased current reports to BOASI and may be presumed to be out of business.

From the companies for which no returns were received in the original mailing, a 20 percent sample was drawn for follow-up by registered mail and by personal contact through the field offices of the Department of Commerce. The group used for the field follow-up consisted of the firms geographically accessible to the field offices. Returns were obtained from about 40 percent of the mail follow-ups, and from 75 percent of the companies contacted in the field.

On the basis of the mail and field returns, it was estimated that almost 60 percent of the companies in the original universe were no longer in business, a figure which checks closely with the independently derived business population estimates of the OBE. A small proportion of firms were found to be out of scope, because they either were not in manufacturing or started in business before 1946. Of those in scope and still in business, about 30 percent submitted reports. In addition, enough returns were elicited from firms no longer in business to provide a basis for making estimates for this group.

Sources of error

In the study of new trade firms, three sources of error in addition to the usual sampling variability were cited. The first of these was due to the inability to obtain replies from all companies in the sample, since those willing and able to respond might differ significantly with regard to their investment characteristics from those who did not reply. The second source, related to the first, was the inadequate coverage of firms no longer in business at the time of the survey. Finally, the sample represented only firms registered with the BOASI and included few if any companies with no employees.

The present study was planned so as to reduce or eliminate the first two types of error. While it was not feasible to obtain a sample of zero-employee firms, the smaller importance of this group in manufacturing as compared with trade makes this third source of variation of less account. Consequently, the estimates for manufacturing given in this article have a smaller margin of error than those for trade enterprises.

Table 6.—Manufacturing Firms Starting Operations in the 1946-48 Period: 1948 Sales Per Dollar of Initial Investment Funds, by Industry, Initial Investment Size and Type of Occupancy¹

Industry	[Dollars]					
	All firms			Renting firms		
	Total	Small ²	Large ²	Total	Small ²	Large ²
All industries	5.3	23.5	6.0	7.2	14.9	6.8
Leather and leather products	12.4	12.2	12.3	12.2	12.2	12.1
Apparel and related products	9.9	18.9	8.0	10.0	18.9	9.7
Furniture and finished lumber products	11.3	7.0	6.2	9.3	11.5	9.1
Textile-mill products	5.1	10.8	5.0	5.4	16.7	8.2
Machinery	5.5	9.4	6.2	5.3	9.6	5.0
Miscellaneous	4.7	15.2	4.5	5.0	10.8	5.0
Transportation equipment	4.8	9.6	4.5	14.8	12.3	15.0
Lumber and timber basic products	4.5	8.6	4.4	4.0	9.0	4.4
Stone, clay and glass products	4.2	4.4	4.2	7.4	7.2	7.4
Metals and metal fabricating	4.6	17.7	2.6	6.0	18.8	4.2
Food and kindred products	2.1	8.8	2.9	4.3	7.2	4.2

¹ Excludes firms with no employees.

² Small firms are those with initial investment of under \$10,000; large firms are those with initial investment of \$10,000 and over.

Source: U. S. Department of Commerce, Office of Business Economics.

Apart from the estimates for all manufacturing in charts 1 and 2, no adjustment was made for the zero-employee firms. It should also be noted that the tables which show the proportions of initial investment coming from various sources or applied to various uses are based on unweighted sample compilations when grouped by size and legal status. This procedure is valid because it was found that when the returns were grouped by legal status and size of initial investment, no significant differences existed between firms in business and those no longer in existence, or between those replying to the initial mailing and those contacted in the follow-up.

Without this grouping, it was found that corporations were disproportionately represented among the initial response and among firms still in business. Also, both corporations and unincorporated businesses showed higher average initial investment in the initial response as compared with the follow-up, and for firms still in operation as compared with those which had left the business population.

The estimates of average investment by industry group and sales size presented in table 1 are averages of the sample returns without adjustment for bias due to nonresponse or for disproportionate representation of firms still in business. Thus the figures in this table should be used as an indication of orders of magnitude applicable to firms other than the zero-employee group, rather than as precise measures of average investment.

Coefficients of variation for a number of the estimates were computed to indicate the degree of variability due to sampling in these figures. The relative sampling error in two out of three random samples does not exceed in absolute value the percentage given by this coefficient; 19 times in 20 it is less than twice this percentage.

The coefficient of variation for the linear unbiased estimate of total investment was 7 percent. The coefficient for the percentage of total investment of new corporations represented by equity capital was 6 percent, while the corresponding figure for noncorporate businesses and personal saving was 7 percent. The equity and personal saving proportions were selected for the computations because the sample indicated that the underlying distributions were U-shaped; the coefficients of variation for other overall proportions estimated should be substantially smaller in most cases.

The coefficients of variation applicable to the various industry and sales groups are larger than those for the total figures; since the sampling error increases as the number in the sample is reduced. An indication of the effect of sample size on variability is given by the coefficient of variation which was computed for the percentage of total investment in the form of equity for food corporations of the middle sales size group. In this sub-group, the sample contained 13 firms, and the coefficient for the estimated proportion was nearly 12 percent, compared with 5 percent for all corporations. Only in the industry-sales size breakdown were there any cells with comparably small samples.

The estimates were carried out in two ways. A "linear unbiased" estimate for the sampled universe, together with an adjustment for the group of zero-employee firms, yielded a figure of \$1.5 billion for total investment of new manufacturing firms during the period 1946 to 1948. A biased estimate with smaller sampling variability, employing the independent OBE business population estimates, gave a comparable total of \$3.2 billion. In view of the various upward adjustments to the BOASI universe required to bring it to the OBE base, the round number of \$2 billion has been used in the text.

In obtaining the unbiased estimate, the returns in each of the two employee-size strata were grouped by legal status, and in each group were separated into three classes: firms replying initially, firms replying in the follow-up, and firms out of business. The total investment reported in each class was multiplied by its appropriate weight to obtain the total for the universe sampled. Average investment for the firms with no employees was estimated by extrapolation on the basis of the sample returns from firms with one and two employees.

Since it was not feasible to obtain complete response even on the field follow-up, the possibility of bias due to nonresponse has not been completely eliminated. This limitation is not believed to be serious.